"Two-Way Street or Two-Way Mirror? Will Canada's Future Army be able to Interoperate with the United States' Army After Next at the Operational and Tactical Level of War?"

A Monograph

by

MAJOR Charles D Claggett

Armour - Canadian Army

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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Abstract

Multinational operations have been the norm in warfare and information management between multinational forces has long been an issue within alliances and in coalition warfare. The ongoing Revolution in Military Affairs (RMA) in information technology (IT) and management (IM) has increased the level of difficulty associated with multinational information interoperability.

Canada's Future Army (CFA) and the US Army's Objective Force (AAN) places a priority on information as a critical requirement for future missions. This is inherent in Canadian and US Army Doctrine manuals, Strategic Visions, and Future Army capability requirements.

Canada recognizes that it will not be able to possess all the operational and strategic ISR resources needed to ensure information superiority to properly support operational battle command. To compensate for this disparity, the Department of National Defense envisions a closer military link to U.S. Forces to allow access to high-end ISR assets. As the US Army continues to move ahead along this technological azimuth, OPSEC concerns over a technological gap between US and other military has caused IM to become dysfunctional. This was the case in Kosovo and unless IM protocols are adjusted, the potential technological gap will not allow the AAN and CFA to share in the common operational picture that will be critical for future operations.

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INTRODUCTION

Nations have traditionally sought out coalition partners and alliances for the obtainment of common political purposes. By definition, coalitions are "an ad hoc arrangement between two or more nations for common action" while alliances are "based on formal agreements between two or more nations for broad, long-term objectives."[1] Yet, it is not always the goal which drive nations to seek partners to obtain their aims. In many cases, obtaining international legitimacy for military action against another sovereign state is very much in the interests of nations. Issues of finance and burden sharing also become factors in why coalitions and alliances form. The contemporary international security environment makes multinational operations a requirement.

Both the United States (US)[2] and Canada[3] recognize that the international environment in 2000 and into the foreseeable future will require coalitions and alliances to operate across the spectrum of conflict. At the same time, the nature of warfare has undergone dramatic innovations and organizational shifts. Information has become increasingly important to modern operating forces. In the recent past, information management (IM) within coalitions and alliances revolved around the abilities of well-educated, capable, and trustworthy Liaison Officers capable of speaking more than one language. Technological innovations have changed this paradigm. Increasingly the language of most operations is binary. Computers and high-speed digital networks are

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[1] FM 3-0 *Operations* (DRAG Edition) 15 June 2000, 2-15.
[2] U.S. Department of Defense. *Concept for Future Joint Operations: Expanding Joint Vision 2010*. Joint Chief of Staff: Washington, DC, May 1997, 18.

replacing the Liaison Officer as the primary means of exchanging information in a coalition.   This creates a different battlefield management imperative.

Timely and accurate information has become a key enabler to many modern forces, particularly those in NATO. Canada's Future Army (CFA) concept places a priority on information as a critical requirement for future missions. This is inherent in Canadian Army Doctrine manuals, the Canadian Forces Strategic Vision and the Future Army Capabilities Study.[4] Canada recognizes that it will not be able to possess all the operational and strategic intelligence, surveillance, and reconnaissance (ISR) resources needed to ensure information superiority. To compensate for this disparity, the Department of National Defense (DND) envisions a closer military link to US Forces to allow access to high-end ISR assets.[5]

The US Army is continuing to leverage information as a critical component for decisive engagement by its Transition (Force XXI) and Objective (Army After Next - AAN) Forces.   Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) assets will form the critical nodes of the future battlefield for the AAN. These nodes will be lynchpins in a commander's battlespace management and the development of a common and relevant operational picture for modern coalition forces.

As the US Army continues to move ahead along this technological azimuth, Canada and many alliance (NATO) and coalition partners will be hard pressed to keep

[3] Department of National Defense. *Shaping the Future of the CF: A Defense Strategy 2020*. Ottawa Ontario: Office of Deputy Minister National Defense, September 1999.
[4] Department of National Defense. *Future Army Capabilities - Draft*. Kingston Ontario: Directorate Land Strategic Concepts, 3 May 2000,14.

pace technologically with rapid innovations in US Army transformation. Coupled with the financial issue is the fact that while alliances like NATO try to operate on standard operating procedure and equipment compatibility, coalitions (because of their strategic nature) do not always have similar operational procedures or interoperable equipment. This raises interoperability concerns within a coalition.

While Canada and other NATO partners have reciprocating information-sharing agreements with the US, many of these agreements are tied to high-end strategic assets that remain compartmentalized at the national level for planning and assessment. Operational and tactical information-sharing protocols, similar to those at the national level, rarely exist in coalition operations. These protocols are routinely established by commanders and staffs within a coalition[6] and can be subject to national IM controls that may prohibit the free flow of information and intelligence. For other NATO and potential coalition partners this issue is exasperated by the diversity of C4ISR infrastructure that exist in some nations. The technological gap that exists today[7] will only increase in the future and could potentially inhibit the whole force from sharing in the common operational picture (COP). Coalition forces sharing a COP will be critical for future operations and essential to successful multinational efforts.

The Revolution in Military Affairs (RMA) in information technology (IT) and IM has increased the level of difficulty associated with multinational information interoperability. This difficulty also has the potential to create a two-tiered IM system by

[5] Department of National Defense. *Strategic Capabilities Planning for the CF*. Ottawa Ontario: Office of Director-General Strategic Planning, 13 June 2000, pp2.6

[6] Allard, Kenneth. "Information Operations in Bosnia". *Strategic Forum, Number 91*. National Defense University: Washington DC, November 1996, 2.

[7] Davis, Jacquelyn K, and Sweeney, Michael J. *Strategic Paradigms 2025: U.S. Security Planning for a New Era.* Institute for Foreign Policy Analysis, Inc.: Herndon, VA, 1999, 175.

compartmentalizing information gathered from advanced sensors and platforms because of a lack of operational and tactical IM protocols. Recent experience in Kosovo and Bosnia revealed that this two-tiered IM issue exists due to interoperability problems and information protection.[8] Instances of this nature will likely increase as the gap in intelligence gathering capabilities widen and the potential for the establishment of a non-integrated information environment in future alliance or coalition operations becomes a real operational concern for non-US partners. If information is to be a critical means to achieve the end in future coalition or alliance operations, then there can not be a two-tiered system of IM.

The monograph question focuses on operational and tactical interoperability of coalition forces in future operations. Specifically, if coalitions are to be the norm for future US and Canadian operations, will CFA and the AAN be able to share operational and tactical information on the battlefields of the future? To answer this question, the author first examines the imperatives associated with coalition warfare, in particular the reasons why coalitions are required for future operations. Next, the author examines information requirements in coalitions needed to achieve a COP for the force at the operational and tactical level. Next, specific information issues is evaluated as they relate to AAN and CFA to ensure that the two forces will be to achieve information superiority in order to conduct decisive operations. The conclusion addresses some specific

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[8] Discussion with Colonel Mike Ward, Director Land Strategic Concepts and Canadian Contingent Commander to KFOR from June 1999-May 2000.

operational issues to ensure that information superiority can occur between the AAN and

CFA.

THE COALITION IMPERATIVE

Alliances and coalitions have been a long-standing theme throughout the annals of warfare. In Ralph Sawyer's examination of Sun Tzu's *Art of War,* he noted that as far back as 1045 B.C during the Chou period, alliances were made to achieve military aims of the Dynasty.[9] History is replete with examples of alliances and coalitions from the Peloponnesian Wars, Napoleon's campaigns of the late 18th and early 19th centuries, the great armies of World War II, and recent operations in Kuwait/Iraq and Kosovo. With such a plethora of historical examples to chose from, one must ask why a nation would chose coalition operations over the what would on the surface appear to be the more simple solution of unilateral military operations?

In the first instance, unilateral operations have and continue to occur. In fact, unilateral options truly define a nation's sovereignty within the Westphalian political state model. Donald Puchala notes that it is a state's "legally autonomous" right within this anarchic system that allows it to be able to execute unilateral military operations in an effort to impose its' will upon another.[10]

If this is a true argument and unilateral operations are a state's definitive recognition of its sovereignty, why are coalition operations so prevalent? To answer this question, one must examine the imperatives that require nations to undertake multinational operations. Many of these are associated with the state system as it exists today. These include the sovereignty, geography, history, and demographics of

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[9] Sawyer, Ralph D. *Sun Tzu: Art of War*. Westview Press, Inc. Boulder , CO, 1994, 41.
[10] Puchala, Donald P. "Origins and Characteristics of the Modern State", *International Politics Today* (Harper & Row,1971), 34.

individual nation-states. Others relate to changing nature of the global economic/political system such as the increase in the size of armies, cost, and global inter-dependence.

The Westphalian state model system defines nation-states as political sovereign units with defined socio-territorial boundaries.[11] For this reason, certain dynamics motivate states to seek other nations to undertake military operations as part of a coalition or to form alliances. While states remain territorially bound by the Westphalian system, most possess some level of national interest that extends beyond its defined borders. This causes states to seek alliances and coalitions in the pursuit of securing national interests. The territorial boundaries of the state system require nations to participate in multinational engagement in pursuit of their own national political goals. For example, Canada has always undertaken military operations within the framework of a coalition or an alliance. In the 20th century, Canada participated in five major wars and on 50 United Nations Peacekeeping missions,[12] all of which operated exterior to North America and in conjunction with another nation's military in pursuit of its national goals and objectives.[13]

Canada and US are both geographically isolated countries. Their shared border has remained peaceful for the past 186 years. Consequently, matters of national security have generally focused on issues external to North America and thus the necessity for global partners that possess like goals and objectives. Similarly, countries that possess shared, but disputed borders, seek external support (coalitions and alliances) to deter aggression from the other state(s). One sees how geography of the state system forces nations to seek international partners in the obtainment of national security objectives.

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[11] Ibid, 27.
[12] Department of National Defence. *Key Defense Roles*. Ottawa Ontario: DNet. http:// www.dnd.ca/ menu/NI/eng/kdr_ips_e.htm.

History plays an important part in why nations seek partners for security issues. A nation's history has a strong role in determining its security issues and international partners. Canada retains strong historical and constitutional ties to England and they have fought along side one another in the pursuit of common national interests. Canada also possesses similar international goals as those of the US and thus aligns along similar security and ideological lines. Thus, one sees how the political history of a nation motives a nation to seek partners with common history and security interests.

Demographics also motivate states to seek partners to align national political objectives. With a population of just over 30 million people, Canada possesses the ninth lowest population density in the world. [14] This makes fewer of the population able to serve in the military as well as reducing the taxation base for expensive government programs including defense.[15] Aside from the ability for a country to afford the capacity for unilateral actions, some nations are demographically driven to seek international partners because as a regional balance of power. The alliances and coalition development before World War I is an excellent example of how nations sought to balance force ratios based on population densities and mobilization potential. [16]

The changing nature of the international security environment has also set up a series of imperatives that support international security partners. The international state system has evolved since 1648. It continues to migrate along lines divergent lines that

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[13] Department of National Defence. CFP 300-1 Conduct of Land Force Operations – Operational Level Doctrine for the Canadian Army, Vol. 1 ,9-2.

[14] Department of National Defence. *The Future Security Environment*. Report Number 99-2. Kingston Ontario: Directorate – Land Strategic Concepts, August 1999, 18.

[15] Ibid, 19.

[16] Bucholz, Arden. *Moltke, Schlieffen, and Prussian War Planning*. Berg Publishers, Inc. Providence, RI, 1991,154.

seek to reinforce issues of state sovereignty but at the same time, erode that same state "right." Multinational security arrangements mitigate this dichotomy.

Collective security arrangements have existed for a long time. Robert Osgood commented that the main reason for this is that "… they are one of the primary means by which states seek to co-operation of other states in order to enhance their own power to protect and advance their interests."[17] In this way, agreements such as alliances form an integral part of a state's national security strategy. In many cases, it is simply a method by which a country can increase its military capacity. While coalitions and alliances existed in the past, industrialization led many nations to augment their national power with the support of other nations armies because of the increased size, cost, and complexity in modern military operations.[18] Burden and cost sharing issues have taken on a whole new meaning as the size; scope and cost of military operations have expanded over the past two centuries. Janne E. Nolan noted that it is the cooperative security arrangements such as alliances and coalitions that,

> … focus on preventing the accumulation of the means of mass, deliberate, and organized aggression, such as the seizure of territory by force … for unilateral gain. Cooperative security does not pretend to have easy answers for the underlying causes of conflict … but may help provide a framework for the international community to organize responses to conflict, including civil violence.[19]

Alliances and coalitions can become cornerstones to national foreign policies when available means are unable to achieve the strategic ends.[20] A critical component in

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[17] Osgood, Robert E. "The Nature of Alliances". *Alliances and American Foreign Policy*. Baltimore: The John Hopkins University Press, 1968, 17.

[18] Schneider, James J. "The Theory of Operational Art", *SAMS Theoretical Paper No.3*. Fort Leavenworth, KS: School of Advanced Military Studies, 1 March 1988, 9.

[19] Nolan, Janne E. Global Engagement: Cooperation and Security in the 21st Century. Washington DC: The Brookings Institution, 1994, 8.

[20] Ibid, 17-18.

preserving the status quo (assuming that is the security goal of a nation) is through bilateral or multilateral security arrangements. Not merely a measure to increase ones military capacity, these arrangements can be preserve the status quo through restraint of allies or deterrence in order for a nation to achieve its goals.[21]   Alliances such as NATO, bilateral security arrangements like NORAD, and the US led coalition in the Gulf War are all examples as to why a nation-state seeks international partners to conduct military operations.

On the reverse side of the coin, the international environment has evolved to erode a state's sovereignty as well. Various influences have wrested away some degree of a state to determine and execute its own self-determination. Ken Booth commented on this fact by noting that the media, human rights, multinational corporations, non-state actors and environmental issues all require a degree of international cooperation that previously did not exist. With the global village comes global intrusiveness. Compounding this matter is that coalitions themselves can be viewed as a being more detrimental to a state's sovereign rights because it can " … limit a members political options and freedom of action."[22] No more vocal a case can be made of this fact then the recent issues regarding target selection during the Kosovo operation.[23]

The erosion of state sovereignty is simply a result of the changes in the international security environment over the past several decades. The complex inter-dependence that exists today did not exist a century ago. Technology has changed the

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[21] Osgood, 19.
[22] Osgood, 19.
[23] U.S Senate Committee on Armed Services. *Testimony of Lieutenant General Michael Short, Commander, 16th U.S. Air Force In Europe, on Senate Armed Services Committee Hearing On The Lessons Learned From The Air Campaign In Kosovo.* US Senate: Washington DC, 21 October 1999, 20-22.

way we view the world and the world us. More actors exist today because technology gives them a voice in matters once left to a few decision-makers.   The system has evolved and with that imperatives for international cooperation that did not exist previously.[24]   In today's international arena, coalitions, far from being a detriment to national security, are required for the purpose of legitimacy. They justify interventions and sovereignty violations in support of national and international interests.[25]

Current Canadian Defense Policy reflects these coalition imperatives. The 1994 Defense White Paper was a document that was still largely tailored for the immediate Post-Cold War security environment but noted the need for Canada to continue to maintain a capability to operate within an Alliance, specifically NATO. Recently, the DND released a new strategic assessment called *Defence Strategy 2020*. This vision updates the guidance of the 1994 White Paper and reflects the changed international environment since the end of the Cold War. Consistent with past national guidance, *Defence Strategy 2020* continues to emphasize the reliance of Canada to participate in multinational coalition and alliance operations.[26]   Of particular interest, and a noted departure from past White Papers, *Defence Strategy 2020* has placed a greater emphasis on maintaining "a capability to work seamlessly with our most important allies… with US forces in particular."[27]   This realization recognizes Canada's present and future security issues will be addressed in a cooperative manner with the US and is therefore a

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[24] Art, Robert J. "To What End Military Power", *International Security, Vol. 4, Spring 1980*, 18.
[25] Nolan, 44.
[26] Department of National Defense. *Shaping the Future of the CF: A Defense Strategy 2020*. Ottawa Ontario: Office of Deputy Minister National Defense, September 1999, Part 1.
[27] Department of National Defense. *Strategic Capabilities Planning for the CF*. Ottawa Ontario: Office of Director-General Strategic Planning, 13 June 2000, 2-6.

critical Defence Objective for the Canadian Government.[28]   As already discussed, Canada's economic and geo-political history have made multinational operations a norm. The recent future planning documents maintain this as a current and future reality.

This coalition imperative has translated into direction for CFA development. Similar to AAN, CFA capabilities focus on future conflict and force structures needed to fight those conflicts by the year 2020.[29]   For the Canadian Forces, this will require the CFA to have "All tactical elements … capable of integrating within separate components of a combined coalition force."[30]   In particular, DND understands that Canadian military participation to deal with international situations will require a tactically self-sufficient unit (TSSU) that is task organized for a specific operation. The TSSU will be   "… modular, adaptable and capable of integrating with other international and national forces … [with] emphasis placed on interoperability with US forces by CF leaders."[31]

The US has similar reasons for seeking multinational operations.   Unlike Canada, the US possesses the capabilities and resources to act unilaterally if necessary in the pursuit of national goals and objectives abroad and is prepared to do so if necessary.[32] However, the US government and military also realize the strategic restrictions of a force projection military, the costs of waging conflicts and the need for international support for the use of military force. According to William Perry, " The threat of military force should be sufficient to obviate the need to use it if the right military and political

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[28] Department of National Defense. *Defense Planning Guidance 2000 (DPG 2000)*. Ottawa Ontario: Office of the Vice-Chief of Defense Staff, May 1999.

[29] Department of National Defense. *Future Army Capabilities - Draft*. Kingston Ontario: Directorate Land Strategic Concepts, 3 May 2000, 1.

[30] Ibid, 8.

[31] *Strategic Capabilities Planning for the CF*, 4.3.

[32]   U.S. Department of Defense. *Concept for Future Joint Operations: Expanding Joint Vision 2010*. Joint Chief of Staff: Washington, DC, May 1997, 18.

conditions are met. The threat will be maximally effective when political conditions permit the military force to be a broadly based coalition."[33] For these reasons, the coalition imperatives generally fall along similar lines for US security policy objectives. The geo-political realities of the US security policies and vital national interests require that they remain engaged overseas by forward-deployed forces or through a series of bilateral and multilateral security arrangements in order to create a stable and peaceful environment.[34]

Canada has maintained a strong coalition and multinational focus when its foreign policy objectives have required the use of the military. Aside from the obvious historical issues involved with its multinational operations, Canada does not possess the means to achieve its foreign policy objectives unilaterally. Similarly, the US has also sought to fight operations within multinational frameworks for geo-political reasons. The strategic security environment now and into the foreseeable future will require the US and Canada to operate within the framework of multinational missions. Having established the fact that coalition warfare is not only a norm, but an imperative for Canada and the US in the future, the fundamental operational issues to allow them to function successfully needs to be addressed. Specifically, as AAN, CFA, and other alliance member modernize their forces to reap the benefits of the information RMA, can

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[33] Perry, William J. "Military Action: When to Use it and How to Ensure Its Effectiveness". Global Engagement: Cooperation and Security in the 21st Century. Washington DC: The Brookings Institution, 1994, 236.
[34] U.S. Department of Defense. *Joint Vision 2010*. Joint Chief of Staff: Washington, DC, 4.

these modern forces achieve information superiority and decisive action within the complex nature of alliances and coalitions?

INFORMATION MANAGEMENT IN THE COALITION:

TWO WAY STREET OR TWO WAY MIRROR?

As noted earlier, the use of military force by nations has normally been conducted as multinational operations. This trend will likely remain due to a greater need for international support and legitimacy for the use of military force in an interconnected and dependent world. This assessment is supported by the governments of both Canada and the US and has translated into essential operational warfighting doctrine[35] and force development guidance[36].

With the need to establish multinational operational forces, there is nonetheless a growing difficulty in making these operations function. The Canada, other allies, and US are improving their force capability through the information RMA. Much discussion has occurred regarding how the information revolution will enable future forces to dominate with smaller and more lethal forces. Information, gained from advanced sensors (land, sea, air, space), will create a near-real time COP that will allow a commander to visualize his battle space more clearly and to make decisions.[37] This is the premise upon which the Force XXI and AAN[38] is based and is a key enabler in CFA tactical and operational force design[39].

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[35] CFP 300-1 Conduct of Land Force Operations, Chapter 9. Also FM 3-0, *Operations (DRAG Edition)* and FM 100-8, *The Army in Multinational Operations*, November 1997.
[36] Department of National Defense. *Future Army Capabilities - Draft*. Kingston Ontario: Directorate Land Strategic Concepts, 3 May 2000, 11-12.
[37] LCdr Pease, Micheal R. *Information Superiority: "Where's The Beef!"* Naval War College: Newport, RI, 13 February 1998, 1.
[38] Mehaffey, Colonel Michael. "Vanguard of the Objective Force", *Military Review*, Vol LXXX, No. 5 September-October 2000.
[39] *Future Army Development Plan*, 21-22.

Common Operating Picture in CFA and AAN

Battle Command is defined as, " the exercise of command in operations against a hostile, thinking opponent."[40] Information is the key to Battle Command because of its importance to superior decision making by the commander in the execution of the fight. A commander's ability to visualize his battlespace comes from the information that he receives to make decisions. This is the basis of the COP. The information that is accessed from national and theater sensors and sources form the foundation upon which a commander exercises command. The COP allows him to "… see and track forces from home station through arrival in theater to combat employment. Commander's use the COP to make more timely and accurate decisions…."[41]

The US Army's Force XXI modernization program was undertaken to maximize information use for the warfight. The US is moving quickly to harness the benefits of the information revolution in order to give commanders a relevant COP. The development of the digital network, software, hardware and backbone of Force XXI has progressed at a rapid pace over the past decade. The Army Battle Command System (ABCS) is the information nexus of the COP. Composed of the Maneuver Control System (MCS), the All Source Analysis System (ASAS), Air & Missile Defense Planning and Control System (AMDPCS), the Advance Field Artillery Tactical Data System (AFATDS), the Global Command and Control System-Army (GCCS-A), the Tactical Airspace Integration System (TAIS), the Combat Service Support Control System (CSSCS), and Force XXI Battle Command Brigade and Below (FBCB2), the ABCS is designed to give US Army commander a seamless, accurate, and relevant picture of his battlespace. These

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[40] FM 3-0 (DRAG Edition), 5-1.

systems are fielding in the 4th Infantry Division and will soon follow with the remainder of III Corps in order to create a Digitized Corps. Eventually the digitized force will extend to include at Major Subordinate Commands in the US Army. A significant adjunct to this capability is the establishment of access nodes that will deploy to augment allies and US Army analog units that do not have the ability to interface with these digital units during transition.[42]

Force XXI will work the issues of connectivity, integration and operational development for the AAN to achieve information superiority. The AAN has made the development and use of the COP a critical component for its warfight of the future.[43] Through a network of directed sensor platforms from the strategic to tactical and the systems and procedures to develop the picture, the commander of the future will dominate his battlespace. Information superiority will allow a smaller force to move, sustain and win the future fight in a more rapid and decisive manner.

The DND also recognizes the revolution that information technology brings to future operations. In its assessment of the emerging strategic environment, DND noted how information has and will continue to change how military missions will be conducted in the future.[44] While Canadian doctrine does not use the term "battlespace", it recognizes five operational functions (command, sense, act, shield and sustain) that form a Canadian version of "battlespace".[45] To meet these functional requirements, the Canadian Army has identified the need to obtain tailored sensors, and C4I systems that

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[41] Ibid, 3-7.
[42]   Twohig, Colonel John J., Major Thomas J. Stokowski and Major Rivera Bienvenido. "Structuring Division XXI", *Military Review*, Vol LXXVIII, No. 3 May-June 1998.
[43] FM 3-0, 11-2.
[44] *Strategic Capabilities Planning for the CF*, 2-11.
[45] *Future Army Capabilities – Draft*, 14.

will allow the development of a COP for tactical commanders within a Canadian or multinational framework.[46]

Similar to the US, Canada has also begun to acquire systems that seek to leverage the information revolution in military affairs. Recent modernization programs and trials are allowing the Canadian Army to acquire advanced tactical C4ISR capabilities to develop a relevant COP for Canadian commanders. The first layer began with introduction of the Iris Tactical Command, Control, Communications System (TCCCS) was the beginning of this process and forms the foundation of the COP structure. This advanced communication backbone will handle voice and data information from the tactical to the strategic level for the Army and functions within NATO STANAG communication protocols in order to ensure interoperability with other allies (Fig. 1). For example, the new combat net radio has the ability to interface with the SINGARs radio.[47]

The second layer of the Canadian network is the Common User Core (CUC). It will form the information databank for shared information within the network. The last layer is the C2 utilities that access the CUC supported by Iris network.[48] These automated decision support and orders tools consist of the Tactical Battlefield Command System (TBCS) and the Situational Awareness System (SAS) for battlegroup and below and the Land Force Command System (LFCS) for division and brigade.[49] This layered

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[46] *Shaping the Future of the CF: A Defense Strategy 2020*, 2-6.

[47] Mooney, Paul. "Army moves to the Forefront of Tactical Communications" *Maple Leaf, Vol.3, No. 4, Feb 2000.*

[48] Buck, Major Wayne. "Send LOCSTATE", *Communication and Electronic Newsletter*, Vol. 36, November 97.

[49] Johnson, Capt Tim. "TACOMS POST 2000 – Communication Standards for the Land Combat Zone". *Communications and Electronic Branch Newsletter, Vol.38.* Ottawa Ontario.

infrastructure will allow Canadian commanders to establish and operate within a similar

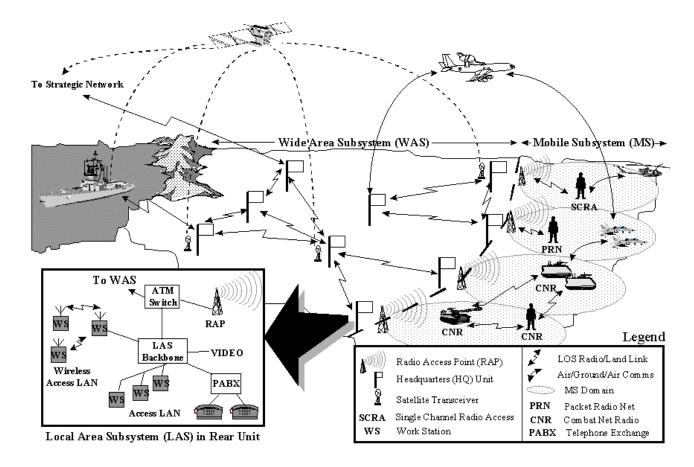information environment to that of the US Army's ABCS.

Figure 1.[50]

Information Management in the AAN and CFA

      The potential of IT RMA has been well documented during the past several

years. The 4ID experimentation at NTC and during the Divisional Advanced

Warfighting Experiment (DAWE), have shown that the information revolution has

allowed commanders on the battlefield an unprecedented degree of knowledge in order to

make decisions. Technology is changing the way we view the battle and will fight in the

future.

One of the most significant changes that IT has brought about is what information is now available at lower levels of command. The revolution in military affairs has fundamentally changed the management of information on the battlefield. The IT revolution enables commanders at much lower levels to access information that had been only used for operational planning at theater and strategic levels. A division and brigade commander used to rely largely on voice and battlefield intelligence in the comprehension of their battlespace. Information from air and space-based sensors that could contribute, were not capable of delivering the information to the unit for timely and relevant use in the immediate fight. Technology today has reversed this process and now allows commanders access to real time information from tactical, operational and strategic sources for immediate synchronization of combat operations. Space based imagery and near or real-time video feeds to task forces on operations in Kosovo shows how information use has change as a result of the IT revolution.[51] Modern operating forces such as those of Canada and the US will continue to rely heavily upon information as a critical component in force design and operational employment of forces in future conflicts.

Canada and other NATO allies have embarked on modernizing their C4ISR infrastructure to harness the effects of the IT revolution in a similar, yet similar manner to the US. In addition, while technology will give commanders unparalleled access to information to support decision making, its management brings with it a whole new set of complexities. This realization became far more apparent during coalition operations in

[50] Ibid.

[51] Eash III, Joseph E. "Harnessing Technology for Coalition Warfare", *NATO Review*. Brussels Belgium, Summer/Autumn 2000, 34.

Bosnia and Kosovo.[52]   Many other nations that operate within today's coalitions do not possess the capability for technological or financial reasons.   Some view this as a detractor for the coalition.[53]   Allies that do not possess the capacity to modernize at the same rate as the US Army brings a large number of associated tactical, operational and strategic difficulties with them to the coalition.[54]

Intelligence has always been a sensitive issue, but the speed and accuracy of the information product brings has augmented the challenge of security. While NATO was able to operate along Alliance guidelines for its first 50 years, the security protocols were established over a long period and were based on a degree of trust that can be found in an alliance.[55] The coalition however will form the more prominent form of warfare and by their very nature are more ad hoc, short-term and goal specific. With the evolving nature of IT and intelligence gathering to support the future warfight, these protocols based on trust developed over a long period is unlikely to exist throughout the entire force. The matter of trust is exasperated by the fact that many nations in these coalitions will have significant technological gap with the US.   This gap will cause nations with advanced collection assets (such as the US) to reduce the visibility of their gathering capabilities and information access due to security concerns. The US will be less likely to share information with coalition partners that have no long standing trust because of the "need" to protect intelligence gathering capabilities and the integrity of their IM system. The

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[52] U.S Senate Committee on Armed Services. *Testimony of General Klaus Naumann (Ret) Bundeswehr (German Army) on The Lessons Learned from the Military Operations Conducted as part of Operation Allied Force, and Associated Relief Operations, with Respect to Kosovo.* US Senate: Washington DC, 3 November 1999.

[53] *Testimony of Lieutenant General Michael Short.*

[54] Alberts, David S. "Coalition Command and Control: Peace Operations". *Strategic Forum, Number 10.* National Defense University, Institute for National Strategic Studies: Washington DC, October 1994.

[55] FM 100-8, *The Army in Multinational Operations.* November 1997, 2-16.

trend for information will become compartmentalized thus inhibiting information sharing throughout the coalition and denying a true COP for the entire coalition. When this occurs, it will fundamentally alter the ability of a commander to visualize his battlespace, and seems to contradict an important assumption of information superiority.[56]

Information: Two-way Street or Two-way Mirror

The speed and detail of the information now available to operational and tactical commanders produces a striking dichotomy. On one hand, the access to information will allow commanders of the AAN and CFA unprecedented knowledge for timely and accurate decision-making. On the other, it brings about security access issues in a operational and tactical environment far less developed than in NATO. Joint and Army doctrine to the contrary, IM in present day military operations inhibits the functioning of the coalition. This problem exists not simply with non-NATO partners but with most nations that operate within a US led military operation, including Canada. Can a coalition function properly if information critical to the successful accomplishment of the mission is not shared?

No other nation possesses the capacity to gather intelligence to the same degree as the US. The ability for US operational and tactical commanders to access the high fidelity intelligence from strategic and operational resources poses a problem in multinational operations because of this monopoly.[57] Nations that contribute to a coalition will continue to operate separate intelligence systems with far less resolution of

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[56] Pease, 2.
[57] Cook, Nick. "Europe Fights To Make Up For Lost Time". *Interavia Business & Technology, Jan 2000, Vol. 55, Issue 638*, 36.

the area of operation.[58]   The concern that has developed stems from the technological gap that continues to widen between the US and other nations as well as the nature of coalition operations. Nations that can participate and develop a COP within a US led coalition may not have access to the tools because of security concerns that stem from the technological gap. For modern forces that will rely on information for decisive action, such a situation is incongruent with a common goal of the coalition.

Military operations in Kosovo have shown that intelligence compartmentalization has become an inhibitor to present day coalition operations even among NATO partners. Understanding that the use of ground forces in support of the air operation was never fully planned or exercised as part of the campaign, the application of the Land Component showed critical weaknesses in information sharing within coalition operations.   Despite the difficulties of the organization, Canadian forces tried to establish an information management arrangement with the US Army in Kosovo. However, there was a " … reluctance to do so is based more on US not wanting to compromise the integrity of their nets/LANs than a desire to truly exploit the tactical information grid."[59]   Despite a history of information and intelligence sharing in NATO and through North American Security arrangements, the ability to establish a tactical or operational level COP between US and Canadian forces in the theater failed due to security issues. For example, the US Army intelligence community also made similar comments on security issues regarding information sharing. The analysis and control element (ACE) that deployed with the US ground force element classified their

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[58] FM 3-0 (DRAG), 2-18.
[59] Discussion with Colonel Mike Ward.

INTSUMs as "not releasable to foreign nationals … because it contained specific reference to enemy activity in our planned engagement area."[60] While the passage of the intelligence from this highly capable unit eventually was authorized to extend beyond the Task Force it remained strictly within the framework of the US military.[61]

At issue are the competing concerns within the security environment of the coalition. OPSEC concerns will always exist because of the ad hoc nature of coalitions. Commanders have a responsibility to preserve combat power by ensuring operational information for the mission is not compromised. Coincidental with the OPSEC issue resides the requirement to ensure a COP for the coalition to obtain a common goal so the commander can exercise Battle Command. Again, the commander has a responsibility to ensure that the forces are kept inform and have the same understanding of the mission, threat, and intentions to ensure force protection and unity of effort in the successful accomplishment of the mission. Yet this dichotomy exists throughout the coalition, regardless of national origin. OPSEC is as important to a Canadian commander in a multinational organization as it is to a US commander. All nationalities seek to balance the security issues to ensure efficient and effective use of forces. It is only when certain national issues arise that an impediment is created.

Information has always been closely guarded. Without the time to develop a degree of trust within the multinational framework there will be a need to compartmentalize to guard national intelligence gathering capabilities. Still this security (or secrecy) creates a dysfunctional arrangement that will exist in future coalition

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[60] Iwicki, Major Stephen K. "The First Combat Deployment of a G2 ACE Team" *Military Intelligence, Vol. 26, No. 1*, January-March 2000, 23.
[61] Ibid, 24.

operations. The potential for US led coalitions to continue to compartmentalize information will establish an IM system that will not be conducive to the establishment or maintenance of a coalition COP.

If trust is a basis for successful operation within a multinational environment, one that all the nations who are participating have committed their soldiers lives to obtain, then the husbanding of information by one party sets up an unacceptable situation. Such a system rivals a two-way mirror in function. Such a situation establishes a tiered information management system. The first tier will include those nations that posses the capabilities to gather and analyze all information from national to the tactical level. In most cases, only the US will possess this capacity. In the second tier will reside those nations that possess some but not all of the capacity to gather and analyze information on the mission. The possibility of this occurring is not only likely, but is now a precedent. The potential of this to reoccur will only increase as the disparities in capabilities widen.

The fact that modern forces will rely more heavily on information to achieve decisive action, makes this trend more troublesome. It is not simply the AAN that seeks to dominate its future battlespace through information superiority. CFA and many other NATO allies are also relying on the same information management for force protection and decisive operations.[62] Of concern is the fact that while part of the coalition, CFA, by virtue of a less robust intelligence capability, will be relegated to the second-tier of a US led coalition operations such as Kosovo.

The likelihood of this occurring is troublesome for a coalition that will seek to achieve its decisive operations through information superiority. This superiority requires

"commanders who are proactive, view information as an element of combat power, trust their subordinates' ability to provide relevant information, and conduct operations accordingly."[63] This requires a two-way flow of information within the multinational framework of the coalition. Battlefield intelligence, as well as other national or operational sources from multinational contingents, are fed into the collection and analysis process of the coalition. This information will combine with other nations' products at a Joint or Combined Intelligence Center where it is processed into intelligence and disseminated throughout the coalition. A coalition that builds firewalls to prevent this from occurring places at risk soldiers, materiel, efficiency, and the ability of the organization to accomplish the mission. Furthermore, mistrust threatens the resolve and strength of any coalition. Thus, information management is a two-way flow of information and intelligence in order to achieve information superiority.[64]

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[62] Department of National Defense. "Canadian Defence Beyond 2010- The Way Ahead" *RMA Operational Working Group Concept Paper*. Ottawa Ontario: 31 May 1999, 4-6.
[63] FM 3-0 (DRAG), 11-1.
[64] Ibid, 11-10.

MAKING INFORMATION WORK FOR THE COALITION

"The written basis for allied unity of command is found in directives issues by

the Combined Chiefs of Staff. The true basis lies in the earnest cooperation of

senior officers assigned to an allied theater. Since cooperation, in turn,

implies such things as selflessness, devotion to a common cause, generosity in

attitude, and mutual confidence, it is easy to see that actual unity in an allied

command depends directly upon the individual in the field."

General Dwight D. Eisenhower

Information for the AAN and CFA will be a critical component to achieve decisive results on the battlefield. However, unless practice meets doctrine, CFA in a US led coalition will have a distinct disadvantage when trying to achieve information superiority. While the US has the capacity to obtain and retain information for its own use, it is contrary to the successful functioning of a coalition based on information sharing. If coalition warfare is the norm, and recognized as such by US planners, then this fundamental difference must be rectified.

At the core rests the commander for it is for him that the information is sought. His decisions will determine whether or not information management will be adaptive and responsive to the whole of the coalition.[65] If information superiority is viewed as a component of combat power, then the commander has the responsibility to ensure that it is properly synchronized to supports the efforts of the force in achieving its

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[65] FM 3-0 (DRAG), 11-2 and 2-18.

goal. In particular, these responsibilities include directing two important interdependent contributors: ISR and IM.

Intelligence, Surveillance, and Reconnaissance

The commander drives the intelligence system through his requirements for information on enemy and friendly forces, terrain, and weather. These requirements are addressed through the Commander's Critical Information Requirements (CCIRs). Within a coalition, information requirements do not significantly change from nation to nation as many are driven by the need for a clearer understanding of the commander's battlespace. However, the means of obtaining information, processing it, and how and what is distributed becomes the issue to be resolved.

Modernizing forces such as those of Canada and other western nations will be able to contribute much to the information gathering process. Canada will continue to provide intelligence at the strategic level through its strategic interface with forces and through bilateral intelligence sharing with the US. As well, CFA's tactical intelligence gathering capability will expand to meet Canadian information superiority requirements. An example of this is the excellent brigade ISR asset in the COYOTE LAV. This advanced sensor suite platform can perform many of the tactical ISR requirements on the non-linear, dispersed battlefield of the future envisioned by force developers in Canada and the US. Furthermore, since the end of the Kosovo campaign, NATO has begun the Coalition Aerial Reconnaissance and Surveillance Project in order to develop greater interoperability between participating NATO nations and to increase their capacity to

locate and attack target.[66]   As CFA evolves, it will bring with it the capacity to be an equal player in the collection management system for the coalition commander at these two levels. However, it is at the operational level that CFA is accepting risk.[67]   Given recent operational events in Kosovo, that lack of established security protocols signals a need to ensure at access to this level of ISR is more developed and implemented.

The key within the coalition is for the commander to understand the strengths and weaknesses that each nation brings to the collection process. Many nations have strategic, operational, and tactical resources that are extremely capable (albeit not as extensive as the US) of adding much to the overall information superiority of the coalition. It is important therefore that commanders understand these capabilities and ensure that they are utilized as part of the joint/combined collection process. It is equally important that information from all sources be synthesized into intelligence for the benefit of all contributing nations to ensure a COP. This will require commanders to determine how to mange information in the coalition and to take an active role in establishing of IM protocols.

Coalition warfare is an understandably complex environment that may thrust commanders from different backgrounds into a similar environment to achieve a common purpose. The fact that Syrian and US forces where both operating on the same side during the Gulf War is testament to this fact. Consequently, there is a severe reluctance on the part of the US to open its C4ISR to the use and inspection of all comers for obvious security reasons. Kosovo revealed the strength of the US in the area information

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[66] Eash III, 34.

[67] Department of National Defense. *Strategic Capabilities Planning for the CF*. Ottawa Ontario: Office of Director-General Strategic Planning, 13 June 2000, 5-7.

collection and management and how important is now and will be to the AAN.[68] With

information being a cornerstone for the transitional and objective force combat capability,

access in an uncertain environment takes a great leap of faith; one that the US may not be

willing to take with everyone.

Many countries possess advanced collection resources of their own or have the

ability to access it from open sources. Nations have a far greater ability to gather theater-

level information than in the past. The issue that remains for the US is that of source

protection for advanced collection systems to ensure that the US can retain their

technological advantage. The critical distinction here is that there is a difference between

source and *information* protection. A source capability, if unique or technologically

superior, should remain protected. However, the information that it generates does not

necessarily need to be. Raw information is screened to ensure specific capabilities of the

sensors are protected so that counter-measures can not be reversed engineered based on

the output. The intelligence community has the responsibility to ensure the protection of

the source. However, it is the commander and staff that has the responsibility to ensure

the information is protected and "[shared] with other nations involved in the operation."[69]

Information Management

Information is a time-sensitive commodity. If it arrives too late or incomplete to

achieve its purpose (a timely and accurate decision) then it is a wasted effort. For

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[68] Cook, Nick. "Europe Fights To Make Up For Lost Time". *Interavia Business & Technology, Jan 2000, Vol. 55, Issue 638*, 36.
[69] Alberts, David S. "Coalition Command and Control: Peace Operations". *Strategic Forum*, *Number 10*. National Defense University: Washington DC, October 1994, 3.

modernized forces such as AAN and CFA that will rely heavily on information for decisive action, this inefficiency must not happen. Consequently, commanders must ensure protocols are established to ensure that information flow is a two-way street, not a two-way mirror. Present and future coalition warfare will "…need to plan in a multinational manner and achieve a workable multilevel security program."[70]

Canada and the US already share a great deal of intelligence and information due to bilateral and multinational agreements. In fact there are over 450 agreements, Memorandums of Understanding (MOU), or security forums to discuss security issues between Canada and the US.[71] These arrangements work within well structured protocols based on years of understanding and trust. In fact, Canada and the US have a well-established agreement for strategic level information and intelligence sharing based on these bilateral arrangements. TCCCS, Canadian participation in the US led Advanced EHF SATCOM System,[72] and possible acquisition of the Global Command and Control System-Army (GCCS-A) support this interchange.

At issue is the fact that IM between Canada and the US already occurs at all levels of war with the most well established being those at the strategic level. The difficulty lies in creating the multilevel security program that will allow CFA to operate at the operational and tactical level in an integrated information environment with the AAN.[73] While technological and financial issues exist, these are manageable. The challenge rests with translating the strategic level protocol interfaces down to the operational and tactical

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[70] FM 100-8, 2-18.
[71] Department of National Defense. "Canadian – United States Defence Relations". Ottawa Ontario: Office of Associate Deputy Minister for Policy (ADM Pol) – Directorate of Western Hemisphere Policy, 1.
[72] Bender, Bryan. "US Offers Secret SATCOM To NATO Partners". *Jane's Defense Weekly, 4 Oct 2000.*
[73] Discussion with Col. Ward.

level commanders and staff to ensure the same degree of integration at those levels as exists at the strategic level.

These operational and tactical protocols begin with the information nexus for Canada and the US. A critical part of the US Army's transitional and objective force structure is the All-Source Analysis System (ASAS).[74] Understanding the importance of this system as part of the ABCS, ASAS Project Manager (PM) has also recognized that future operational environment will involve combined operations. This makes the need for interoperability between ASAS and like systems a necessity. With this in mind, the ASAS PM has undertaken a collaborative effort with DND Electronic Warfare Command and Control Program to ensure interoperability between the systems. This will requires that ASAS ensure interoperability with the ABCS Common Database (ACDB) and that ACDB can interface with DND's CUC for the LFCS.[75]

Common information between Canada and the US already exist at the strategic level through an open and interoperable common database. That means that once TCCCS and LFCS are operational, CFA will be able to access operational and tactical information that is passed to the strategic level through the shared common database to ensure a Level 3 theater information exchange and COP.[76] The technical issues therefore are less a concern then the ability to ensure that the information remains common and not compartmentalized.

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[74] Fritz, LTC Gregory J. and Montie, LTC Micheal E. "All-Source Analysis System" *Military Intelligence PB 34-98-4 Vol. 24 No. 4,* October-December 1998, 17.

[75] Ibid, 19-20.

[76] US Department of Defense. *C4ISR Architecture Framework Version 2.0*. C4ISR Architecture Working Group (AWG): Washington, DC, 18 December 1997, 2-4 to 2-5, 3-3 and D-5.

Technical issues still exist between Canadian and US forces as well as between the US Army and NATO at large. But it is the security protocol at the operational and tactical level of the coalition that clearly requires clearer articulation and establishment. Bosnia and Kosovo revealed that this information fusion has yet to occur formally. Most recent cases reveal that in the absences of these formal protocols, the commanders and staff work through issues to ensure the passage of information. OPSEC must come attached with a degree of common sense. NATO commanders in Kosovo, understanding the inherent weakness, overcame the security issues to ensure information was exchanged. The use of coalition support teams and Analysis Control Teams (ACT) with ASAS Remote Workstations (ASAS RWS) provide the technological capability,[77] yet it is the commander that ensures that information flow is a two-way street and not tiered.

In most cases, it was based on a commander's ability to know that information is an important, if not vital, component of successful operations, especially coalition operations. However, presently this relies on the personalities of commanders and coalitions do not always have commanders that foster a cohesive working relationship. Given this fact, the establishment of protocols is needed between Canada and the US. This would ensure that the same level of information management that occurs at the strategic level is migrated to the operational and tactical level for the AAN and CFA. Given the importance of information superiority for both forces, the consequences of not achieving a COP could be severe.

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[77] Crane, f^t Lt Mike E. "Multinational Brigade-East ACT Operations in Kosovo: 18th Airborne/Air Assault (Poland) ACT". *Military Intelligence, Jul-Sep 2000, Vol. 26, No.3*, 30.

CONCLUSION

Canadian and US joint operational doctrine recognizes that coalition and alliances will be the most likely way in which forces will operate in the future. The difficulties associated with alliance based operations was exhibited in Kosovo. Yet it persisted based on the limited scope of the operation, the fact that it was largely one-dimensional US-led operation and because the NATO Alliance had operated together for over 50 years. Years of established procedures, agreements, and training together in a unified atmosphere was able to overcome some critical operational warfighting issues. Coalition operations, however, are less likely to be grounded upon these same conditions since they are traditionally more ad hoc in nature.

Modern armies require information superiority to achieve decisive actions once committed to operations in pursuit of national goals. For Canada, the US and many other likely coalition partners this means that information will have to be acquired and widely disseminated to ensure that commanders make decisions faster and more accurately than their adversary in order to dominate their battlespace. This necessity is a key ingredient in the achieving decisive and unified results for both the AAN and CFA. Without this ability, forces within the alliance or coalition will be at risk.

The RMA that has occurred during the past decade has had a profound impact on the structures and capabilities of the future forces of Canada and the US. Our forces will rely heavily on information to achieve decisive results with fewer, more lethal units within a multinational framework. Both Canada and the US recognize this fact and that will likely be operating together within a multinational framework. To that end, they have and continue to work on ensuring interoperability with one another using existing

arrangements and agreements. However, the RMA has brought with it issues that may not be capable of being handled by these existing forums. Canada and the US have science and technology (S&T) agreements that may not fully encompass the changes in other realms and levels of war. IM in Kosovo is one example that reveals how strategic protocols and agreements have not migrated down to the operational and tactical level although the capability has.

Canada recognizes this fact as it relates to its future force and has recommended the establishment of new technological agreements and forums to address specific information RMA matters as they relate to the force.[78] However, these recommendations seek to ensure hardware interoperability as opposed to the actual protocols that will allow the information to flow using the technology. The matter of information access and release will remain uncertain within a US-led coalition unless greater interest is garnered and procedures established to enable a CFA COP using all the resources of the coalition.

The US has also recognized the need to amend how business is conducted regarding IM. Attention is being paid on several fronts within the Department of Defense (DOD) regarding this specific issue. In an article entitled *A Common Footing: A Prescription For Improving Information Interoperability In Multinational Operations*, Rear Admiral Robert Nutwell, Deputy Assistant Secretary of Defense for C3ISR, noted,

> Some barriers to sharing national information are clearly necessary and inevitable. Nonetheless, multination information exchange can be improved by removing unnecessary bureaucratic obstacles and by adopting processes and technologies that facilitate sharing when permitted by national policy. Furthermore, a collaborative review of operational information-sharing

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[78] Department of National Defense. "Canadian Defence Beyond 2010- The Way Ahead" *RMA Operational Working Group Concept Paper*. Ottawa Ontario: 31 May 1999, A-1/4.

policies may reveal areas in which these policies can be relaxed by prior agreement.[79]

The US Deputy Secretary of Defense has also commented on the need to increase industrial collaboration in developing of a new C4ISR/IT infrastructure to include a Multinational Information Distribution System (MIDS) to ensure interoperability and IM within a multinational framework.[80] While nothing definitive has occurred regarding this issue, the fact that DOD is examining the issue points to the significance of the issue.

The fact that Canada and the US are likely to operate in less ordered multinational operations means that the information enablers for that environment must exist to facilitate its operation. The information RMA brings with it great potential to ensure that the AAN and CFA will be able to decisively achieve their strategic, operational and tactical goals through information superiority. However, information is not the panacea for unified action. It is simply an enabler to achieve that result. If information will be key to the operational effectiveness of the AAN, CFA, and the multinational framework in which it operates, then it must function effectively throughout the force. Without specific attention to the matter of IM in this operating environment, given present and future systems, then the key enabler of the force may end up to be its Achilles heel.

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[79] Nutwell, RAdm Robert M and Price, Col Danny. "A Common Footing: A Prescription For Improving Information Interoperability In Multinational Operations". *Armed Forces Journal*, November 2000, 34.
[80] Ibid.

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